

The low-risk perception of developing type 2 diabetes amongst women with the previous history of gestational diabetes: A qualitative study.

Introduction

Gestational diabetes mellitus (GDM) is a transient glucose intolerance first defined during pregnancy.¹ It can affect up to 3.5 per cent of all pregnancies in England.² The incidence of GDM has increased rapidly in the past two decades in response to the dramatic and sustained rise in obesity amongst women.^{3,4,5} Recent studies show that up to half of women diagnosed with GDM develop type 2 diabetes within five years.⁶ Research indicates that lifestyle interventions can significantly delay or prevent the appearance of type 2 diabetes in this population.^{7,8,9,10}

It is vital that women are provided with clear and timely information about their future diabetes risk, and offered a feasible and tailored intervention that fits with women's multiple roles.^{11,12} NICE recommends that women with GDM should be offered lifestyle advice (weight control, diet, and exercise) and a fasting plasma glucose measurement at the 6-week postnatal check and annually after that.^{6,10} Achieving a significant and sustained behaviour change towards positive lifestyle modification depends on multiple factors, including the effectiveness of health intervention, risk perception, health beliefs, and psycho-social barriers.^{13,14,15}

Research confirms that a high-risk perception of developing diabetes in the future is an important motivator for engaging with screening and lifestyle modification in women with GDM.^{16,17,18} However it has also been suggested that most women consider GDM as a temporary condition, simply a reversible complication of pregnancy and only a few perceive themselves at an increased risk of developing type 2 diabetes.^{18,19} This lack of knowledge

and low-risk perception may, therefore, be an important factor in limiting the self-efficacy of adopting and maintaining positive lifestyle behaviour.[20,21](#)

This study aimed to explore risk perceptions, health beliefs and health behaviours of women with a recent history of GDM in Merseyside, UK. The objectives were to assess their awareness of the increased risk of type 2 diabetes associated with GDM, involvement in diabetes screening programmes and participation in lifestyle diabetes prevention measures post pregnancy.

Methods

Study design

Semi-structured interviews are widely acknowledged as the most effective approach for exploring participants' views on a phenomenon including perceptions of risk and self-reported behaviour.[22](#) Therefore, one-to-one semi-structured qualitative interviews were chosen as the primary means of data collection.

Twenty English speaking women, living in the Merseyside area, aged between 18 to 40 years (at the time of pregnancy) with a previous history of GDM, diagnosed before 31st March 2012 were selected from the antenatal diabetes database at Royal Liverpool University Hospital and invited to participate in the study. Nine participants agreed to be interviewed. Two women who were diagnosed to have type 2 diabetes were excluded from the study.

Qualitative research designs work well with relatively small numbers and usually have an inverse relationship between the numbers of participants and the amount of data collected.[23,24](#) Hence, a limited number of participants were recruited to collect rich data through open-ended questions till new themes stopped emerging, suggestive of data saturation. [25,26](#) After interviewing seven participants, it was found that the answers were becoming repetitive. Consequently, no new codes and themes were emerging. It was realised that more data

collection would not provide any new insights and a sample size of seven was considered appropriate.

Data collection

All interviews were conducted at the Royal Liverpool University Hospital in the diabetes department over a period of three months. The process was flexible, and arrangements were made to resume interviews at times more suitable and convenient for participants, considering that childcare and other commitments of mothers with young children can be a barrier to participation. A semi-structured interview was used as a guided conversation, organised around a limited number of predetermined, open-ended questions, to initiate and stimulate the conversation.²² The interviewer kept her responses to a minimum, occasionally paraphrasing or reflecting and letting other questions emerge from the dialogue between the interviewee and herself to facilitate the collection of rich data and optimise achievement of thematic saturation.²⁷ All of the Interviews were voice recorded and transcribed with the participants' consent.

Data analysis

Thematic analysis was adopted for data analysis because it is a simple, straightforward and flexible method and helps in producing "rich and detailed, yet complex" accounts of qualitative data.^{28,29} The data was collected and analysed by the principal investigator appropriately trained to conduct qualitative interviews. Data processing was supervised by the research team (two academic supervisors) to ensure rigour and methodological integrity, as well as to avoid researcher bias.

The raw data from each interview was very rich and detailed. A systematic thematic analysis was undertaken to identify, analyse and report the patterns and themes within the data in six phases.²⁸ The first phase included familiarising with the data by transcribing it, repeated

reading, meaning search, finding semantic themes and extracting meaning through repeated patterns. Possible patterns were shaped out, and emerging themes were discussed with the research team, which informed the subsequent analysis. [28,29](#)

In the second phase, potential codes and patterns were highlighted in the transcription, and a list of codes was developed for reference, and cross-checking.[28](#) Data relevant to each code was collated into meaningful groups.[29](#) All initial codes relevant to the research question were incorporated into themes.

The third, fourth and fifth phases included sorting different codes into potential themes, reviewing them, refining and generating a thematic map of the analysis, and defining and naming the themes considering the research question.[28,29](#)

The sixth and final phase of producing a report of the analysis started after collating a set of fully worked out themes.

Ethics considerations

Ethics approval was approved by the NHS Research Ethics Committee (South Hampshire B) and Research and Development office (The Royal Liverpool and Broadgreen University Hospital, NHS Trust).

Findings

Eight themes emerged during data analysis. Four of these (postnatal screening, follow-up health advice and intervention, risk perception, and health awareness) were the main identified themes as they were relevant to the research question. The other four themes were not corresponding to the research question, hence excluded.

Theme-1: Postnatal screening

All but one participant remembered having a postnatal blood glucose test after a few weeks of their delivery. Surprisingly, no one reported having any blood glucose tests, or Glucose Tolerance Tests (GTT) repeated after the first postnatal screening.

“When I was discharged, I had a little letter that said you should be tested for diabetes in six or eight weeks about after having a baby. So I made an appointment to go and see my GP..... I had the test, and it resulted fine. They've never called me for a test since then.” (Patient 1)

Other participants concurred with this.

“I think I just went one time six weeks after but never had to go back again”. (Patient 2). “They just did a blood test straight away. It was really soon after I had my daughter and they said I didn't have it anymore and that was the end.” (Patient 4).

When this participant was specifically asked about the follow-up screening, her reaction was the same.

“None, I haven't had any since it went from that pregnancy and I had a test. I haven't had any follow-up. The only time I did, I got pregnant again, and I obviously went to have a glucose tolerance test, and it came back negative, so that was that.” (Patient 4)

Theme-2: Follow up health advice and intervention

All the seven participants reported receiving risk warnings regarding the immediate pregnancy outcome from dietitian, physician or diabetes specialist nurse during their pregnancy.

However, only two out of seven participants reported receiving a one-off warning for the increased risk of developing type 2 diabetes in the future,

“I was told by my doctor that I no longer have gestational diabetes so I was quite happy and I know that I've returned back to normal now, but I do remember that I need to stay healthy, do regular exercise because I don't want to develop type 2 diabetes.”
(Patient 6)

None of the participants reported receiving follow-up information or advice beyond the first post-delivery check.

“Nothing was advised. The test had come back negative. I was signed off. They did say if you have had gestational diabetes you are at higher risk of developing diabetes in later life. I'm sure with anybody if their diet is unhealthy then anyone is at risk of developing diabetes, so it didn't necessarily mean so much. I was just relieved that I didn't have it anymore. ” (Patient 2)

Some participants were more motivated than others, and they acquired information through the internet, family members or other resources.

“No, it's my own research and my own information but nobody ever actually furnishes me with the information, no.” She also added “My sister and my dad are both type 2 diabetic and my grandma was type 1 diabetic, and we have diabetes in both paternal and maternal side of my family. So I am quite knowledgeable about how to control diabetes with a healthy diet.” (Patient 1)

“It's basically what I've read because the only information I got at the time was all about the birth and because I was 37 weeks and how it was going to impact on that but I wasn't really given future advice or future follow-ups. (Erm a short pause) I did go back for a fasting glucose test when my child was a few months old, and it was fine, but they didn't give me any future advice. Anything I know, I've just what I have read online.” (Patient 5)

“I guess I'm interested in being healthy and I think it's an individual's responsibility to keep themselves healthy and I want my children to be healthy. I've done dancing for most of my life, so I guess I understand looking after your body and keeping your body working properly. (Erm...) I think educated people do have a good understanding of a healthy lifestyle. I also work in media, so I'm absorbing those messages, I'm aware of health issues especially in this city that there are huge incidences of heart disease, diabetes and cancer and I guess once you are reading about those you are aware of what can cause them. ” (Patient 4)

Theme-3: Risk perception of developing diabetes in the future

A variation in the level of perception and attitude towards the risk was observed. Five out of seven participants knew that they had a risk of developing diabetes but were not sure about the possibility of avoiding or delaying the risk or moreover, the action required to avoid or delay the risk. Three of them believed that they had a risk, but their level of risk was the same as any other woman without a history of GDM. While two participants were not aware of the risk at all.

“I believe I'm at high risk of developing type 2 diabetes after having gestational diabetes, but that's my belief. I don't know whether it is true or not. Got a lot of type 2

diabetes in the family, due to my weight and I am aware of the risk factors. I'm not at the moment but don't know what to do just to find it but regards to any other risk factor nobody ever told me anything."

When this participant was asked about her source of information she replied

"Nobody said that I'm at a high risk. Nobody said that I should be tested on a regular basis. They just said you are not diabetic now. It's just my following it through really giving assurance that I am not at the moment but don't know what to do just to find it but regards to any other risk factor nobody ever told me anything." (Patient 1)

Another participant reported

"They did say you are at high risk of developing diabetes in later life and gave me some very good leaflets, but I'm sure anybody with an unhealthy diet is at risk. So it didn't necessarily mean so much. I was just relieved that I didn't have it anymore." (Patient 2)

"I don't know to be honest because my mindset has been that once the pregnancy is over (pause...) I'm at as much risk as anyone else, and therefore the healthy eating messages and all of those things will be the same, but I don't know if that is true." (Patient 4)

"I don't know. I know you can develop diabetes through pregnancy there is a big chance especially if you are overweight that is a big factor." (Patient 7)

But when she was asked if she thinks that there is any connection between gestational diabetes and diabetes the reply was

"No, I don't think so. You can get gestational diabetes when you are pregnant, but with diabetes, I don't see any connection." (Patient 7)

Participants could not see any connection between GDM and developing type 2 diabetes in the future. Therefore, despite receiving health warnings, they did not see GDM as a future threat to their health. They perceived GDM as a temporary health condition, and after their first postnatal screening, they were relieved to know that they no longer had it. Moreover, the participants were not very confident about required actions.

Theme-4: Awareness of normative healthy lifestyle

All the seven Participants showed some understanding of the normative view of a healthy lifestyle. This included healthy eating, controlled alcohol intake, smoking hazards and increased physical activity. However, some statements were very vague, and the qualitative interview for this research project has just provided a short overview of participants' health awareness. Therefore, these findings were not sufficient for reflecting on participants' overall understanding of positive health behaviours.

“Even though I'm overweight, I do eat a very healthy diet; I still try to follow low GI where possible because I know it lowers the sugar down and you know a healthy diet. I do eat sugars, I obviously feel like I deny it, but then I go a bit crazy afterwards so I do allow myself the sweet things that could not allow in gestational diabetes but still my main meals are low GI food. I follow myself really just try and control it. I try to be more active, but I struggle on that.” (Patient 1)

Others demonstrated their understanding of healthy lifestyle as follows.

“For me, it is taking some exercise every week; I try to go to the gym two times a week. I am busy with the children anyway never really sitting down. For me, eating is something I love to do, and if I am trying really hard to curb my eating, I will cut out sugar. It is quite important, and I am very aware because of diabetes, that I am

at higher risk. I try to keep the processed sugar to a minimum if possible. I think I eat a normal diet. We eat fresh fruit and vegetables in the week but also have takeaways and eat out. I wouldn't say I'm particularly healthy, but I'm not on the far scale." (Patient 2)

"I understand that a healthy lifestyle is a good balanced diet, not too many carbohydrates, not too much greenery, but it's to have a good balanced diet and to exercise regularly." (Patient 6)

All of the participants reported receiving healthy lifestyle advice during their pregnancy, so they tried to remember and follow whatever they were advised at that time. Some tried to acquire more information from different possible resources, but none of the participants reported receiving any postnatal health advice or counselling.

When asked about lifestyle changes, a variation in attitudes and actions was noticed. Five out of seven participants did not make significant changes to their lifestyle because either they did not have information or they considered their lifestyle to be healthy.

"I haven't made any changes as a result of having it. The changes come because my children have got older and it is easier for me to go out and exercise and cook healthy. If somebody had given me more information and I was more aware, possibly I would make other changes, but I have not had that information, so I am just carrying on as normal." (Patient 2)

Others reported

"In terms of my diet and my attitude I think everything is same apart from the only difference is that I don't drink. I used to have a glass of wine most evenings, but now I hardly drink." (Patient 4)

“It was the same as always. That was why I took it so personally and was so insulted because I didn’t understand it and I thought it was related to lifestyle initially because I have always been a member of the gym and I do think I have a healthy diet.”
(Patient 5)

Two participants accepted that they needed a change, and they were trying to adopt a healthy lifestyle, but the reason for the desired change was not s the risk of future diabetes.

“I’ve always dieted, I’ve always been a yo-yo dieter, and I have always stuck to Slimming World, and I’m on Slimming World now.” (Patient 7)

This participant was then asked if this has anything to do with her diagnosis of GDM or of any health advice she was given.

“I go on my own as I have always been overweight. I have always had a weight problem. I’d like my children to do the same because my daughter has got a weight problem. That was my own decision to go to Slimming World. I was worried about my weight.” (Patient 7)

Discussion

Similar to a previous study, [13](#) in this study researchers also noticed a contrast between the responses related to immediate risks of complications during the pregnancy and the long-term risk of developing diabetes after pregnancy associated with GDM. Our cohort recalled that during the pregnancy they were consulted regarding the immediate effects of GDM on pregnancy, delivery and foetal health. In most cases, risk information brought participants worries, concerns, and anxiety but also helped in achieving favourable pregnancy outcomes by following the suggested health behaviour. These findings comply with the Health Belief

Model that participants adopt positive health behaviour only if they believe that they have serious but avoidable health risks.¹⁶

Complying with some previous studies ^{14,20,21} most of the participants in this study also had a low-risk perception of the future risk of developing diabetes. A few participants, who knew about the risk, also believed that their risk was no different from women with no history of GDM. This contrast was probably obvious because participants were made aware of the serious consequences of uncontrolled diabetes during pregnancy and they did not want to compromise the health of their baby. However, as the risk of developing type 2 diabetes in the future was not an immediate concern, the perception of GDM as a risk factor for developing diabetes in the future became diluted following childbirth. The findings suggested that participants did not take the 'one-off' future health warning seriously and reported an absence of subsequent reinforcement. Once participants had a post-delivery screening and were declared 'clear' it was assumed that the 'problem' had resolved.

It appeared that the reassurance from health professionals further lowered the risk perception for developing diabetes in the future. As a consequence, GDM was perceived as a temporary condition, and many participants believed that their condition had been resolved following childbirth.

Despite the low risk perception some participants reported looking for information on the internet or from family members with type 2 diabetes. Women who tried to look for information seemed to be the ones who also attempted to adopt a healthy lifestyle suggesting that women with higher self-efficacy are more likely to change their lifestyle. Nonetheless, the reliability of self-acquired health information can be argued because unreliable health information can cause more harm than benefit.

The researchers have also identified a variation in participation in postnatal screening, follow-up screening and health intervention programmes. The reported postpartum screening rate in the current study was high as shown in three previous surveys conducted in the UK.^{30,31,32} All but one participant in the current study remembered having a postnatal screening after a few weeks of delivery, but none reported receiving any health counselling or reminders about annual follow-up screening. These results are consistent with another retrospective patient data survey that was conducted in the UK and revealed a low (20%) annual long-term screening rate. ²

The results of two national surveys in the UK showed that around 90% of health professionals reported providing risk counselling and 90% recommended annual screening for all GDM patients.^{30,31} However, one other research survey reported only 39% long-term follow-up of gestational diabetic patients. ³² and participants of this current study also did not report receiving any health counselling. This can be argued that the two national surveys ^{30, 31} were based on health professionals' reports and self-reported studies are often criticised for overestimated reported rates. Therefore conducting a patient survey probably depicts a better picture.

Though not related to the direct research questions, we also found that time constraints, lack of energy, and family responsibilities were a few barriers which influenced lifestyle changes. It was found that lack of physical activity was mostly affected by increased demands of child care. Healthy eating was also difficult because most of the participants reported that newborn child became a priority and they did not have enough time to cook healthy meals for themselves. Whereas, health concerns, desire to live longer, being a good role model for their children and weight loss was reported as a few motivational factors for positive health changes. The HBM describes that a person is more likely to opt for positive health change if one believes that the benefits of taking action exceed the associated barriers.¹⁶ This inverse relationship could be used to overcome the barriers by promoting health benefits. These findings can be used for developing new effective intervention programmes for GDM patients.

Strengths and Limitations

The main strength of this study is that it is patient-oriented research, designed to explore patients' perspectives through their experiences. The qualitative approach generated a large amount of rich data from relatively small numbers of participants through open-ended questions. As very limited qualitative research is done in this field, the results of this research provide a detailed account of patients' perceptions and experiences. However, as a limited number of participants were recruited from a single centre, and the data collected was a retrospective account of the patient experience, this research only presents a glimpse of risk perception and health behaviour in a local area and does not provide a full picture of practice in the UK.

Implications

Despite the introduction of national guidelines, the present study has shown a scope for developing a well-structured, long-term follow-up health intervention programme incorporating a reminder system for annual screening for diabetes in women with previous history of GDM. Considering that participants do not have access to health guidelines, and early symptoms of the development of the type 2 diabetes are not visible, the responsibility of raising awareness towards the risk lies with the healthcare system. It was evident that providing a one-off postnatal screening with a brief risk warning was not adequate for promoting risk perception and positive health changes. Therefore, a strategy for reinforcement of risk warning and an assurance that proven strategies of lifestyle modification can probably help reduce the risk of developing diabetes in the future in this population. However, considering the small size of this study, we recommend a larger study to support these findings for wider application.

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